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**From:** Whittier, Robert [Robert.Whittier@doh.hawaii.gov]  
**Sent:** 10/15/2016 12:18:04 AM  
**To:** Pallarino, Bob [Pallarino.Bob@epa.gov]; Ron Chinn [ron.chinn@innovex.net]; Linder, Steven [Linder.Steven@epa.gov]; Shalev, Omer [Shalev.Omer@epa.gov]; steven.chang@doh.hawaii.gov; roxanne.kwan@doh.hawaii.gov; Frazier, William Mark [william.frazier@doh.hawaii.gov]  
**Subject:** Re: monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?  
**Attachments:** Red Hill pumping and Wter Levels.pdf

Hi All,

Since we are spending so much time talking about Red Hill pumping (or lack thereof), plotted pumping vs. water levels at RHMW05 (nearest the Red Hill Shaft) and RHMW01 (near UST 2). I track RHMW01 since the downhole sampling pump gets removed during the monthly oil/water interface measurements making it the most accurate time series data. The water levels started dropping a couple of months after the pumping ceased, so likely rainfall driven. However, the water level at RHMW05 increased slightly relative RHMWM01 when pumping ceased. At RHMW05 the water level is taken with the downhole pump installed so the water level could be biased low due to the interface between pump tubing and the water level cable.

Thanks,  
Bob W.

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**From:** Whittier, Robert  
**Sent:** Friday, October 14, 2016 12:59 PM  
**To:** Pallarino, Bob; Ron Chinn; Linder, Steven; Shalev, Omer; Chang, Steven Y; Kwan, Roxanne S  
**Subject:** Re: monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?

Ron,

Here is the Reader's Digest version of the pump test. It appears that a response to the shutdown of the Halawa Shaft were detected in wells on the Red Hill side. However, the Red Hill Shaft could also account for the water level perturbations so some ambiguity. I believe the pump test data was included with one of the data sets I passed on to you. Should be an Excel file with a name similar to this attachment. Would be happy to send again.

Bob W>

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**From:** Pallarino, Bob <Pallarino.Bob@epa.gov>  
**Sent:** Friday, October 14, 2016 12:45 PM  
**To:** Ron Chinn; Linder, Steven; Shalev, Omer; Chang, Steven Y; Whittier, Robert; Kwan, Roxanne S  
**Subject:** RE: monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?

Ron,

Thanks for the additional info.

Regarding the pumping test, yes we were aware of it. Bob Whittier would be the best person to discuss it with. I believe there were some interesting results, which is what has led us to believe that there may be some connection of the

groundwater across the Halawa Valley. I may have some of the data but Bob may be able to put his hands on it easier than I can.

Bob Pallarino  
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**From:** Ron Chinn [mailto:ron.chinn@innovex.net]

**Sent:** Friday, October 14, 2016 3:34 PM

**To:** Linder, Steven <Linder.Steven@epa.gov>; Pallarino, Bob <Pallarino.Bob@epa.gov>; Shalev, Omer <Shalev.Omer@epa.gov>

**Subject:** Re: monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?

FYI – in case you need a decoder ring:

3-2254-001 is Red Hill Shaft – shows shutdown of pumps in February

3-2255-032 is the Navy's Aiea Halawa Shaft (I don't know anything about this well) - shows an strong uptick in pumping rates in February

3-2354-001 is BWS Halawa Shaft – no change.

Also:

12M AV = 12 month rolling average

WUP = Water Usage Permit. Not relevant to us, but note that the Navy's Aiea Halawa Shaft is pumping well above its permitted limit.

It's possible that the Navy increased production from their Waiawa Shaft (3-2588-10) as well, though we don't have this info. We don't need this information, but during the tour, the Red Hill Shaft operator indicated that they had increased Waiawa's pumping rate. He may have been mistaken.

This is interesting:

<http://files.hawaii.gov/dlnr/cwrm/agenda/2015/ag20150520.pdf>

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files.hawaii.gov

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denise antolini kamana beamer michael g. buck

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Navy Red Hill Tank Spill Updates

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- a. Legislative Actions Related to Red Hill – HB0645, HB0987, HCR066, HCR0126, HR0078, SCR0057, SR109-SD1, SCR0174
- b. Announcement – May 7 to May 22, 2015 BWS Conducting Shutdown of Halawa Shaft (3-2354-001) TMK: (1) 9-9-010:008 while U.S. Geological Survey (USGS), Honolulu Board of Water Supply (BWS), and Commission Staff monitor the effects on water levels

Are you guys aware of this study? I wonder what they discovered.

—Ron

Ron Chinn, PE, PMP, CHMM  
President & CEO

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**From:** "Linder, Steven" <[Linder.Steven@epa.gov](mailto:Linder.Steven@epa.gov)>  
**Date:** Friday, October 14, 2016 at 2:56 PM  
**To:** Ron Chinn <[ron.chinn@innovex.net](mailto:ron.chinn@innovex.net)>, "Pallarino, Bob" <[Pallarino.Bob@epa.gov](mailto:Pallarino.Bob@epa.gov)>, "Shalev, Omer" <[Shalev.Omer@epa.gov](mailto:Shalev.Omer@epa.gov)>  
**Subject:** FW: monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?

FYI

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**From:** Chang, Steven Y [<mailto:steven.chang@doh.hawaii.gov>]  
**Sent:** Friday, October 14, 2016 2:52 PM  
**To:** Linder, Steven <[Linder.Steven@epa.gov](mailto:Linder.Steven@epa.gov)>  
**Subject:** monthly pumping rates submitted for Red Hill Shaft and Halawa Shaft?

Here are the attachments...steve